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■ Original Article

## The Contribution of Contraceptive Implants to the Contraceptive Method Mix in Jos, Nigeria: A 34-year Review

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### ABSTRACT

**Background:** Contraceptive implants are long-acting reversible methods of contraception that have been in use in Nigeria for about 34 years. The aim of the study was to evaluate the contribution of these contraceptive implants relative to themselves and other contraceptive methods in the facility.

**Methodology:** This was a retrospective descriptive study of over three decades of use of the various types of contraceptive implants in Jos, Nigeria. The period covered in the study was January 1985 to December 2018, a 34-year duration. The records of all clients that used the implant and clients that used other modern methods of contraception were retrieved and analyzed. The information extracted from the records of implant users included the year of introduction, year of exit if applicable and the yearly number of new method acceptors. The total yearly acceptance of other methods of modern contraception accepted by clients was also computed from the register.

**Results:** Four contraceptive implants have been introduced into the contraceptive armamentarium in Jos up to the end of the year 2018. Norplant, Implanon classic, Jadelle and Implanon NXT were introduced in 1985, 2006, 2007 and 2016 respectively. The contraceptive implants contributed 19.1% of all new acceptors of family planning methods. Norplant was in use for 22 years, Implanon classic for 11 years, Jadelle for 12 years and Implanon NXT for 3 years. The Norplant implants accounted for 1,383 (28.2%); Implanon classic 1,805 (35.5%); Jadelle 1,591 (31.3%); and Implanon NXT 302 (5.9%). The trend of implants acceptance was multi-modal, influenced by availability and affordability. Norplant and Implanon classic have been out of use by 2018; only Jadelle and Implanon NXT were available for use by desiring clients.

**Conclusion:** The long-acting reversible contraceptive implants have made a significant impact on the contraceptive method mix in Jos. They occupied the prestigious second position amongst the other contraceptive methods. The acceptors we believe have enjoyed good maternal health within this period in

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addition to reduction in maternal mortality and morbidity. It is anticipated that this momentum be sustained and if possible improved upon for safe, effective, long-term, reversible and cost-effective family planning.

**Keywords:** contraceptives, implants, long acting, reversible, Jos-Nigeria

## Introduction

Family planning is an important component of reproductive health and central to the sustainable development goals. Family planning has been described as a key driver of all seventeen sustainable development goals. It is an essential cross-sectoral intervention that can speed up progress in every aspect of this anticipated development.<sup>1</sup> Whether or not women and girls have access to contraception will have an enormous and perhaps determinative impact on our ability to reach the sustainable development goals in every country by 2030.<sup>1</sup> It is of significant contribution for the primary prevention of maternal morbidity and mortality by preventing unplanned or unwanted pregnancy. Thus, family planning remains one of the most effective ways of improving maternal health. Family Planning is achieved largely by the use of modern contraceptive methods that are expanding with time and demand.

Progress in family planning has been relatively small in low and middle-income countries when judged by the unmet need for contraceptives, this is more in the sub Saharan African countries. Nigeria over the years has shown little progress in contraceptive prevalence. A number of developmental, political, medical, legal, technical, financial and socio-economic barriers have to be overcome to achieve a positive trend in contraceptive use in sub Saharan countries.<sup>2,3</sup> The Nigeria demographic and health survey 2018 showed only a modest increase in modern contraceptive prevalence rate in the last two surveys from 9.8% to 12.0%.<sup>4</sup>

Jos university teaching hospital, a type A family planning facility provides all the contraceptive mix available in the country including the contraceptive implants. Jos participated in the research for the introduction of Norplant along with 4 other sites in the country in 1985, the results of which were widely published and circulated.<sup>7</sup>

After the completion of the research and guaranteed safety and effectiveness, service provision continued for Norplant and other contraceptive implants that followed.

Research has led to significant advances in the development of new modern contraceptive methods over the years, increasing the options from which clients could choose. The contraceptive implants were introduced into family planning armamentarium in Jos, Nigeria with the aim of meeting the contraceptive needs of all women, being long acting and reversible. The primary mode of action of subdermal implants is prevention of ovulation. Secondary modes of action include prevention of sperm penetration of the cervical mucus due to increased thickness and implantation by thinning the endometrium. The implants were said to be safe, convenient and highly effective. They have long term effect, are reversible and free from estrogen-related side effects.<sup>5</sup>

Data have shown that contraceptive implants are very effective and safe, with evidence suggesting no serious health events when compared to women who use no hormonal methods or women in the general population.<sup>6</sup> Implants require very little user compliance or motivation when adequately counseled. Therefore, the use effectiveness rates are almost equal to their theoretical effectiveness.<sup>7</sup> Additionally, implants do not adversely affect the quantity or quality of breast milk since they do not have estrogens, and this makes them suitable contraceptives for breastfeeding mothers.<sup>8,9</sup>

Although there are few draw-backs to the use of contraceptive implants, the benefits far outweigh the disadvantages. During the pre-insertion counseling, potential disadvantages like the provider dependence for insertion and removal, risk of minor surgery, infection and discomfort after insertion and removal are discussed. Implants may

cause disruption of menstrual bleeding pattern enough to cause discontinuation of the method in some patients due to bleeding irregularities. In addition, implant users may experience headache, acne, mastalgia, mood and weight changes. Clients for contraceptive implants should also know that it does not protect against STI/HIV. When clients are well counseled, they become more tolerant of the changes in menstrual bleeding pattern that often occur. This varies widely and it is difficult to predict the change a particular client would experience.<sup>7</sup>

Norplant<sup>®</sup> consisted of 6 capsules each containing 36mg of levonorgestrel and effective for a period of 5 years. Jadelle<sup>®</sup> comes as 2 capsules each containing 75mg of levonorgestrel and also effective for 5 years. Implanon classic<sup>®</sup> and Implanon NXT<sup>®</sup> come as a single capsule, containing 68mg of etonogestrel and effective for 3 years. In addition, Implanon NXT<sup>®</sup> contains 15mg Barium sulphate for easy location when palpation fails to locate it. This study aims to evaluate the contribution of these contraceptive implants over the years relative to themselves and other contraceptive methods in the facility.

### Methodology

This was a retrospective descriptive study aimed at sharing our experiences of over three decades of use of the various types of contraceptive implants, a type of long acting reversible contraception (LARC), in the family planning clinic of Jos University Teaching hospital. The period covered in the

study was January 1985 to December 2018, a 34-year duration. The records of all clients that used the implant and clients that used other modern methods of contraception were retrieved and analyzed. The information extracted from the records of implant users included the year of introduction, year of exit where applicable and the yearly number of new method acceptors. The total yearly acceptance of other methods of modern contraception accepted by clients was also extracted from the register. Simple percentages were computed and comparison made with other contraceptive methods accepted within the same period of study. The trend was plotted for comparison with other methods. Condoms were excluded from the data collated as data was inconsistent and incomplete. More so, the condoms were now more used for the prevention of HIV/AIDS in discordant couples than for contraception. The cervical cap and diaphragm were also excluded for incomplete data.

### Results

Within the study period, a total of 26,578 new clients accepted various methods of contraception in the facility. The contraceptive implants were 2nd among the methods accepted, constituting 19.1% of all the methods. The intrauterine devices were first, constituting 28.7%. Other methods were the oral contraceptive pills (18.0%), female sterilization (17.2%) and the contraceptive injectables (17.0%) Table 1.

**Table 1: Contraceptive Methods so far accepted by new clients (n = 26,578)**

| Contraceptive Method     | New acceptors (%) |
|--------------------------|-------------------|
| Intrauterine Devices     | 7,631 (28.7)      |
| Contraceptive Implants   | 5,081 (19.1)      |
| Oral Contraceptive pills | 4,771 (18.0)      |
| Female sterilization     | 4,565 (17.2)      |
| Injectables              | 4,530 (17.0)      |

The contraceptive implants included Norplant introduced in 1985, Implanon classic in 2006, Jadelle in 2007 and Implanon NXT in October 2016. Jadelle replaced Norplant while Implanon NXT replaced Implanon classic. As at the end of

2018, only the Jadelle and Implanon NXT implants were being offered to clients in the facility. Among the implants, Norplant was accepted by 27.2% while it was in circulation, Implanon classic 35.5%, Jadelle 31.3% and Implanon NXT 5.9%. Table 2.

**Table 2: Distribution of Contraceptive Implants accepted by New Clients over 34years (n = 5,081)**

| Contraceptive Implant (duration in years) | Acceptors (%) |
|---|---------------|
| Norplant (22)                             | 1,383 (28.2)  |
| Implanon classic (16)                     | 1,805 (35.5)  |
| Jadelle(12)                               | 1,591 (31.3)  |
| Implanon NXT (3)                          | 302 (5.9)     |

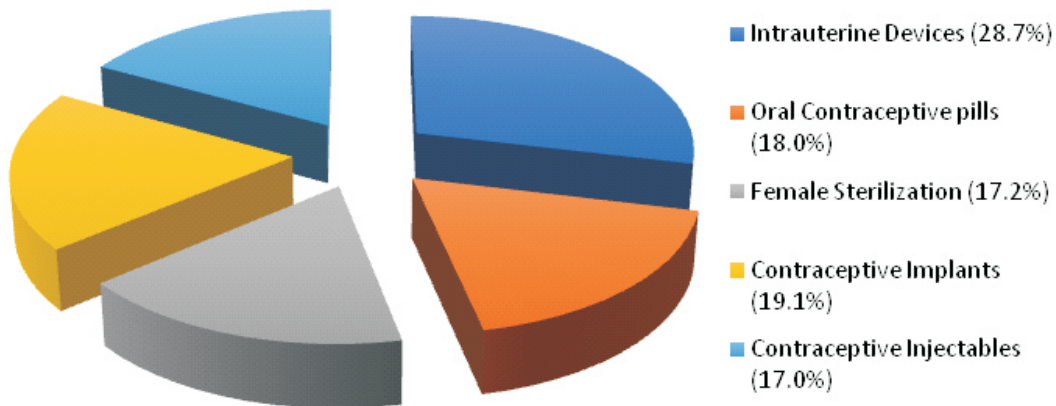
Figure 1 showed the place of contraceptive Implants amongst other contraceptive methods.

The highest acceptance was by those accepting intrauterine devices followed by the contraceptive implants. The oral contraceptive pills, female sterilization and the contraceptive injections followed respectively.

Figure 2 demonstrated the multi-modal acceptance of the contraceptive implants over the 34-year period. It also shows the period of introduction, withdrawal, duration of usage and acceptance of the various implants. Norplant was introduced in 1985 and discontinued in 2006, overlapping with the introduction of Implanon NXT in the same year. Norplant was therefore used by clients in Jos for a period of 22 years. Implanon classic was introduced in 2006, used for a period of 11 years and replaced by Implanon NXT in the same year of discontinuation, 2016. Jadelle has continued to be used by clients from 2007 to 2018

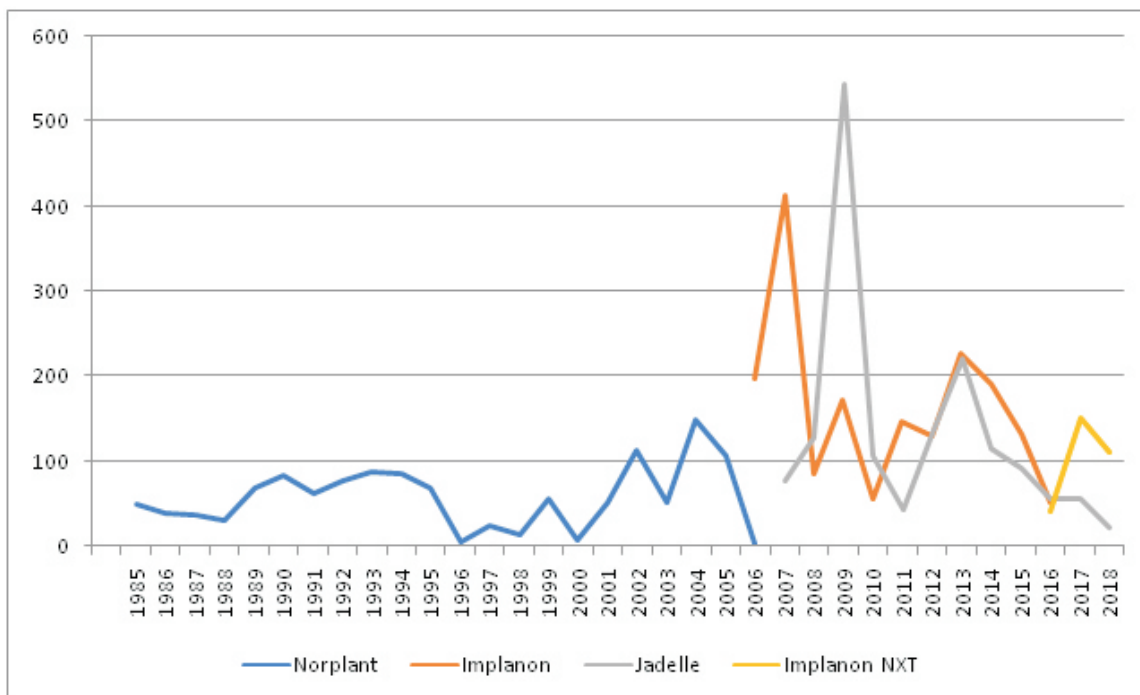
and beyond.

Norplant acceptance showed multi-modal trend, with the highest acceptance in 2004 when supplies were at the peak. The lowest acceptance was in 1996 and 2000 when supplies dwindled to almost zero. The cost also determined the acceptance as there was minimal subsidy after the initial introduction. With the introduction of Implanon NXT and Jadelle, Providers were trained and the implants were provided free to clients at the initial time. This demonstrated the peak acceptances 2007 for Implanon classic and 2009 for Jadelle respectively. There was increased acceptance also in 2013 for both Implanon classic and Jadelle. Implanon was however phased out in 2016 and replaced by Implanon NXT in the later part of the same year. By the year 2017 and 2018, only two implants (Jadelle and Implanon NXT) were available in the clinic for insertion, Figure 2.



**Figure 1: The Contraceptive Implants amongst other Contraceptive methods**

The highest acceptance was by those accepting intrauterine devices followed by the contraceptive implants. The oral contraceptive pills, female sterilization and the contraceptive injections followed respectively.



**Figure 2: The introduction and trend of the Contraceptive Implants**

## Discussion

Four contraceptive implants have been introduced into the family planning armamentarium of the facility namely Norplant<sup>®</sup>, Jadelle<sup>®</sup>, Implanon-classic<sup>®</sup> and Implanon NXT<sup>®</sup>. Norplant<sup>®</sup> implant was the first to be introduced in 1985. This was followed by Implanon classic<sup>®</sup> in 2006, Jadelle<sup>®</sup> in 2007 and recently Implanon classic has been replaced by Implanon NXT<sup>®</sup>, a modified form of Implanon classic<sup>®</sup>.

Contraceptive implants were second only to intrauterine device over the period of study, constituting 19.1% of all the methods. This is encouraging considering the fact that, it is a relatively new method compared to the others in use at the facility. Subdermal implants accounted for about 31.9% of acceptors of all methods of contraception in Abakaliki, Nigeria between 2009 and 2013 which is much higher than the findings in this study.<sup>11</sup> Socio-cultural variation in the two populations may be responsible for the differences observed.

By 2005, Norplant<sup>®</sup> contributed an average of 4.9% of all contraceptive methods in the facility over a period of 21 years.<sup>5</sup> The highest acceptance was recorded in 2003 when it contributed about 13% of all contraceptive methods accepted in the facility. Like in all family planning facilities in Nigeria, Norplant<sup>®</sup> enjoyed patronage for 22 years and was then withdrawn from further use due to difficulty/inconvenience of inserting or removing six implant rods compared with 2 or one. In its place, researchers worked on the replacement for Norplant<sup>®</sup> with the 2-rod Jadelle<sup>®</sup> which has the same effectiveness and duration of action, but fewer number of implant rods to be inserted or removed. However, there was a time lapse of a year, awaiting approval by the regulatory agency in Nigeria and by then, the single rod Implanon classic had been introduced in 2006 before Jadelle. Jadelle came into use in 2007, one year after Implanon classic. Implanon classic<sup>®</sup> was in use from 2006 to 2016, (11 years) and was replaced by Implanon NXT<sup>®</sup> containing the same hormone, effectiveness and duration of action. The only difference being that the capsule also contains

Barium sulphate for easy localization by x-rays and ultrasound when palpation fails to locate it.

The implants contributed 19.1% of the methods accepted and were second only to intrauterine devices (28.7%) in acceptance among the other methods. Trailing behind the contraceptive implants were the oral contraceptive pills, female sterilization and the contraceptive injectables. This means that the acceptance of contraceptive implants is high among clients in Jos, Nigeria compared to other longer existing methods. This may be explained by its high efficacy, long acting, reversibility and tolerance of side effects amongst others. The national acceptance rate for Norplant was about 20% by 2002<sup>12</sup> when it was the only contraceptive method in use compared with the other contraceptive methods.

In Jos, an earlier study found an acceptance rate of 22.4% for Implanon classic in 2010.<sup>13</sup> An earlier study in Ilorin had a 3.6% acceptance of Implanon classic between 2007 and 2011 among all contraceptive methods.<sup>14</sup> This was much lower than the earlier study in Jos. The reason for this difference is unclear, but may be environmental factor, possibly socio-cultural differences in the two populations.

Jadelle<sup>®</sup>, the replacement for Norplant<sup>®</sup> came into use from 2007 and is still being used. As of 2018, Norplant<sup>®</sup> had contributed to 27.3%, Implanon classic<sup>®</sup> 35.5%, Jadelle 31.3% and Implanon NXT 5.9%. The low acceptance rate of Implanon NXT may simply be because of the very recent introduction since it had been in use for only 3 years, compared to Implanon classic (11 years) and Jadelle (12 years). Norplant implant enjoyed monopoly while it was in use and therefore the acceptance cannot be compared with the other implants. However, Jadelle, and Implanon classic were in use at about the same period. During this time, their acceptance was comparable. Towards the end of the study period, the newly introduced Implanon NXT appeared to have an edge over Jadelle. The reason may be that clients tend to gravitate towards a newly introduced implant hoping to have fewer side-effects which may be more tolerable. Jadelle had a prevalence of 4.7%



among family planning acceptors in Ilorin.<sup>15</sup> In another study, an acceptance rate of 5.2% was reported in Port Harcourt<sup>16</sup> Few years after the introduction of Norplant in Ilorin, an acceptance rate of 93.7% was reported. The need for professional insertion and removal and the greater difficulty of termination were suggested as possible reasons.<sup>17</sup> These reasons for the high acceptance rate may only be speculative but not substantiated.

The Norplant implant maintained a relatively low yearly acceptance with few bi-modal peaks and the highest peak in 2004, when a large consign-ment of the product was rolled out in anticipation of the arrival of Jadelle implant. The supply was generally limited in addition to the cost which was out of reach of the average client in the environ-ment. Both Implanon classic and Jadelle had initial peak acceptance as explained earlier. In addition, in 2011, the Federal Ministry of Health in the country had directed that all family planning commodities be provided to intending clients free.<sup>18</sup> Thus, the highest peaks in 2007 was for Implanon classic and 2009 for Jadelle. However, the trend for both implants demonstrated multi-

modal pattern of acceptance. This was due to irregular supply of the implants to the clinic from source. There was increased acceptance also in 2013 for both Implanon classic and Jadelle during which costs were lowered for clients. Implanon was however phased out in 2016 and replaced by Implanon NXT in the later part of the same year. By the year 2017 and 2018, only two implants (Jadelle and Implanon NXT) were available in the clinic for insertion.

### Conclusion

These long-term reversible contraceptive implants have made a significant impact on the contraceptive method mix in Jos. They occupied the prestigious second position amongst the other contraceptive methods. The acceptors, we believe have enjoyed good maternal health during this period; in addition to reduction in maternal mortality and morbidity.<sup>19</sup> It is anticipated that this momentum would be sustained and if possible improved upon for safe, effective, long-term, reversible and cost-effective family planning.

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